



Changes to PA System: CCA to CRA

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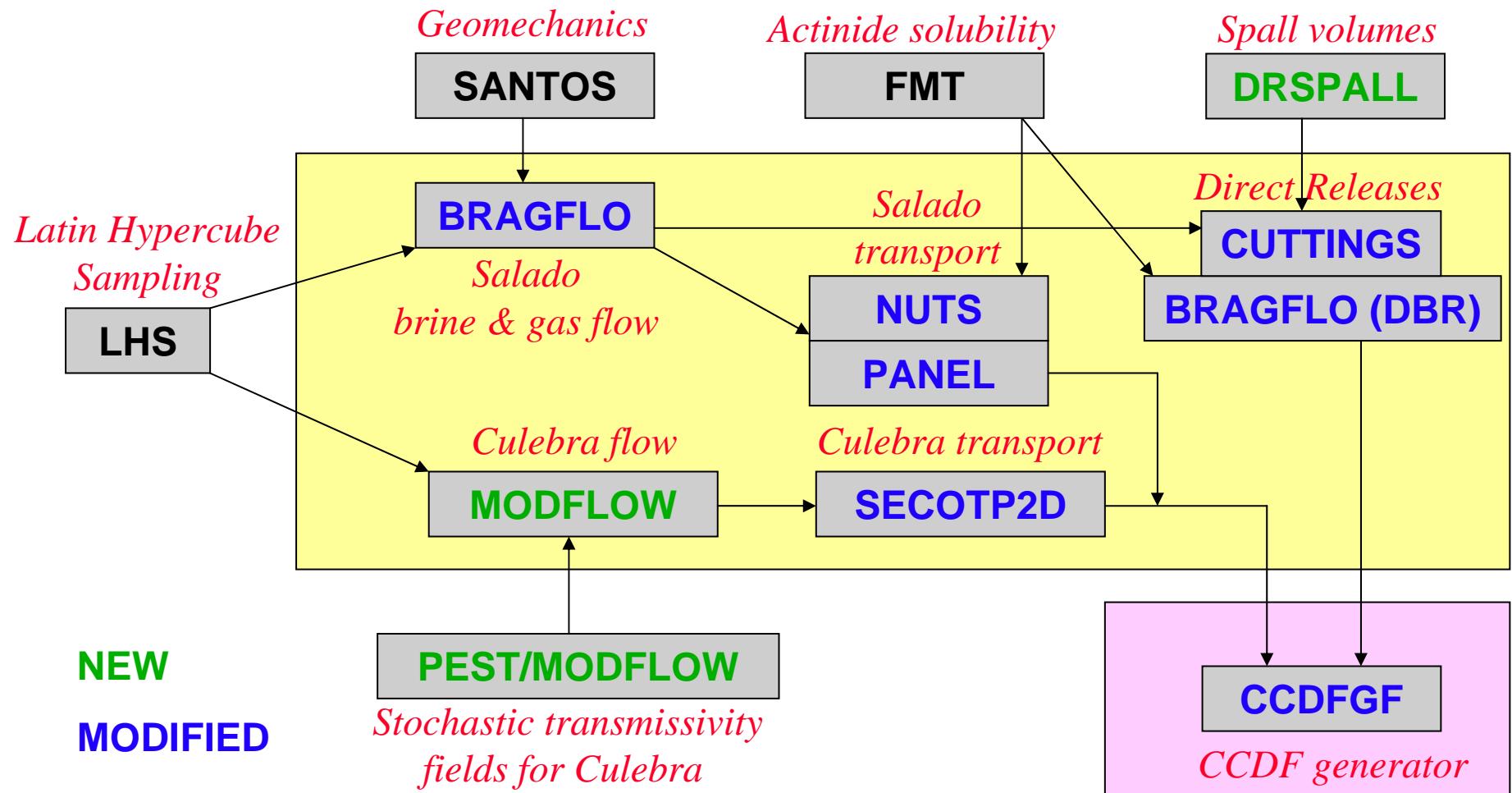




Major Components of PA System

- **Codes (computational models)**
- **Platforms**
 - OpenVMS Alpha Cluster (modified from CCA)
 - Linux PC clusters (new for CRA)
 - Linux PC (for AMW, not used for CRA)
 - Tru64 Alpha (for AMW, not used for CRA)
- **Parameter database**

Major PA Codes in the CRA



Changes to Major Codes

Code	CCA	PAVT	CRA
BRAGFLO	4.00	4.10	5.00 (I/O)
NUTS	2.02	2.05	2.05A (dimen.)
PANEL	3.60	3.60	4.02 (add. param.)
GRASP-INV	2.01	2.01	N/A (replaced)
SECOFL2D	3.03	3.03	N/A (replaced)
PEST	N/A	N/A	5.51 (new)
MODFLOW2K	N/A	N/A	1.6 (new)
SECOTP2D	1.41	1.41	1.41A (dimen.)
CUTTINGS	5.03	5.04	5.10 (DRSPALL)
DRSPALL	N/A	N/A	1.00 (new)
BRAGFLO_DBR	4.01	BRAGFLO 4.10	BRAGFLO 5.00
CCDFGF	2.00	3.00	5.00A (rewrite)



Platforms – OpenVMS Alpha Cluster

- **OpenVMS Alpha cluster for the CCA**
 - 10 x Alpha 2100s
- **OpenVMS Alpha cluster for the CRA**
 - 2 x ES40 (BTO and CSN)
 - 2 x ES45 (CCR and ELO)
 - 1 x 8400 (MCH)
 - One Alpha 2100 (Elton) retained as EPA node
- **Hosts most computation models (except SANTOS, FMT, PEST and MODFLOW)**



Operating System for OpenVMS Cluster

- CCA: OpenVMS 6.1
 - Updated to OpenVMS 7.1 June 1999
 - Updated to OpenVMS 7.2 in June 2000
 - Updated to OpenVMS 7.3-1 in August 2002
- CRA: OpenVMS 7.3-1
- All codes tested on new OS and hardware
 - OpenVMS 7.3-1 on ES40 approved June 12, 2003
 - Approval of ES45 and 8400 pending



Platforms – Linux PC clusters

- Two PC clusters of 16 machines each
 - allman
 - lylin
- Host MODFLOW/PEST codes to perform Culebra flow field calculation
- MODFLOW/PEST qualified according to NP 19-1



Platform – Linux PC and Tru64 Alpha

- Single standalone PC (warthog) supports SANTOS for legacy work
- Tru64 Alpha (BOC) supports SANTOS for current work (AMW analyses)
- Not used for CRA – SANTOS results unchanged from CCA



Parameters

- CCA: WIPP Database using INGRES
- CRA: PA Parameter Database (PAPDB) using SQL server
- Parameters migrated in phases:
 - From INGRES to SQL 7 (both on Alpha server) (1998)
 - From SQL 7 (Alpha) to SQL 2000 (Intel) (2001)
 - Data migrated to new data model (PAPDB) (2002)
 - Additional parameters migrated during Salado Flow Peer Review (shaft, etc.) (2002)
- Migration from CCA to PAPDB (with shaft parameters)
approved May 15, 2003
- Subsequent parameter changes for the CRA (inventory, spallings, etc.) under review



Parameter Changes Since CCA

- Adopt PAVT values

- Long-term borehole permeability
- Borehole plug permeability
- DRZ permeability
- Effectiveness of passive institutional controls
- Waste shear strength
- Inundated steel corrosion rate
- Probability of hitting a brine pocket
- Drill string angular velocity
- Castile brine rock compressibility
- Castile brine pocket permeability
- Waste permeability

- Incorporate corrections

- Matrix distribution coefficients
- Compressibility (bulk vs. pore)
- Correlation between Castile compressibility and Castile porosity

- Changes for updated inventory

- Other changes in value

- Solubilities (recalculated)
- Drilling rate (updated)

- New parameters

- Panel closures
- Simplified shaft model
- DRSPALL parameters
- Hardwired values from BRAGFLO, CCDFGF
 - Gas binary interaction parameters
 - Volume fractions of waste